UNITED STATES MARINE CORPS
Logistics Operations School
Marine Corps Combat Service Support Schools
PSC Box 20041
Camp Lejeune, North Carolina 28542-0041

LOC 1510

STUDENT OUTLINE

JOINT OIL ANALYSIS PROGRAM

LEARNING OBJECTIVES

1. Terminal Learning Objective: Given a unit's T/O&E and the references, supervise maintenance-related programs, to ensure proper execution of maintenance programs and maintain equipment readiness per the references. (0402.03.01)

2. Enabling Learning Objective: Given the references and a requirement to manage a unit's maintenance related programs, supervise the management of the Joint Oil Analysis Program (JOAP), per the references, identify the: (0402.03.01e)

   a. Purpose of the Joint Oil Analysis Program
   b. Equipment associated with JOAP

OUTLINE

1. PURPOSE AND USE

a. Purpose. Oil analysis is a general term to describe scientific test and evaluation performed on used oil. It attempts to determine whether the oil may be retained or must be changed, and also provides information on internal condition of engines, transmissions, and other oil-wetted components.

b. Establishment. JOAP is an agreement between the NAVY, ARMY, and Air Force, which standardizes the policies, procedures, research, and development of the entire program. The Marine Corps is an associate member of JOAP coordinating group which is responsible for implementing and monitoring the program.

c. Use. The oil can be analyzed using one of two methods:

(1) Spectrometric Analysis. Used to determine, the concentrations of various Wear Metal in oil samples. Wear metals are metal particles of microscopic size, produced by the friction of moving parts within the mechanical systems that enter the oil stream and are dispersed and suspended throughout the lubricating oil system. The analysis determines which component parts may have generated the particles.

(2) Physical Property Analysis. Used to detect property changes in used oil. Changes in viscosity, fuel dilution, or water content may be indicative of faulty equipment, operating conditions, or maintenance procedures. This analysis is instrumental in eliminating the wasteful requirement of changing oil based on hours, miles, or calendar days as currently specified by technical manuals and lubrication orders. Physical property analysis is the preferred method for determining equipment component or part replacement.

(3) Oil and filters may be changed when recommended by the oil analysis lavatory.

d. The determination to change the oil and filters will be the responsibility of the unit commander or his designated representative.

e. Local Marine Corps collection and handling processes will be detailed in your unit's quality assurance SOP. Many procedures will be equipment peculiar. Oil contamination and equipment internal wear is operating environment related.

2. MAJOR ITEMS/COMPONENTS AFFECTED

a. Major Items Affected. The Engineer, Motor Transport, and Ordnance items listed in enclosures (1) through (3) of TI-4731-14/1_ and assigned to units on their Tables of Equipment (T/E's) are enrolled in the program.

b. Components Affected. Engines and transmissions as applicable to equipment listed in TI-4731-14/1_.

c. Warranty Items. Oil filters will be changed per recommended interval until expiration of the warranty. If the servicing laboratory identifies a problem requiring either maintenance or lubrication change, the oil analysis monitor will contact the warranty coordinator for guidance. After expiration of warranty, oil and filters will be changed as required, using the applicable TM's and oil analysis laboratory's

recommendations as guidelines. However the final determination to change the oil and filters will be the responsibility of the unit commander or his representative.

d. Exemptions. Equipment which is deployed from its home site, or used for developmental purposes, static displays, or training aids are exempt from the oil analysis program.

3. OIL SAMPLING

a. When to sample

(1) Schedule Samples will be conducted for equipment listed in TI-4731-14/1C enclosures (1) through (3) in conjunction with preventive Maintenance Checks and Services.

(a) Equipment procured with a manufacturer's warranty will have oil sampling scheduled and performed in conjunction with the PMCS as indicated in the applicable Technical manuals (TM's) until expiration of the warranty period.

(b) Equipment not procured with a manufacturer's warranty or when the warranty has expired will have oil sampling scheduled and performed in conjunction with the PMCS per the commodity chapter of reference (b).

(2) Special Samples are submitted for the following reasons:

(a) At the request of the Laboratory.

(b) After an engine or transmission has been replaced.

(c) After indication of a problem (overheating, excessive oil loss, etc.) or contamination (cloudy, dirty, watery, visible metal particles, etc.).

(d) At the Commander's discretion, special samples will be marked SPECIAL and banded with red tape or marked with some other conspicuous manner. The DD form 2026 that accompanies the samples to the laboratory will be marked SPECIAL in the remarks block and its borders will be outlined in red.

b. How to Sample

(1) Samples may be taken without warming a component to operating temperature if either the equipment has been operated within the last 30 days or ambient temperature allows.

(2) Ambient temperature may often be too low to easily take a sample. In these cases, equipment should be operated just enough to warm the oil.

(3) Samples taken immediately after addition of new oil will not be sampled and tested until the old and new oil is completely mixed.

c. Sampling Methods (See Paragraph (3) page 3 of TI-4731-14/1_).

(1) Valve Method - Open the sampling valve to flush a SMALL amount of oil from the line. Fill approximately ½ inch from the top of the Sampling Bottle (1). Immediately write the equipment serial number on the bottle.

(2) Pump Method – Used to take samples through the dipstick hole. (instructions are included with the pump).

d. Sampling material

(1) Owning units will budget for and procure the required sampling material in amounts consistent with the density and variety of their equipment.

4. REQUIRED FORMS (See enclosure (3) of TI-4731-14/1_ and TM 4700-15/1_.)

a. DD Form 2026 (Oil Analysis Request)

(1) Preparation instructions are provided in TM-4700-15/1_.

(2) Once returned to the unit by the laboratory, the most current form is retained with the equipment.

b. DA Form 2408-20 (Oil Analysis Log)

(1) Preparation instructions are provided in TM-4700-15/1_.

(2) This form is filed and maintained in the Ordnance Vehicle Logbooks, Motor Vehicle or Engineer Equipment Record Folder (NAVMC 696D), or centrally managed file as designated by the unit commander.

c. DA Form 3254-R (Oil Analysis Recommendations and Feedback)

(1) Preparation instructions are provided in TM 4700-15/1H.

(2) This form is sent to the using unit by the Army oil analysis lab to recommend maintenance when an oil sample analysis indicates a problem.

5. OIL ANALYSIS LABORATORIES. Army laboratories are preferred over other JOAP laboratories because (1) they offer both spectrometric and physical property testing, and (2) the Army Oil Analysis Program provides the Marine Corps with a single database to maintain historical data.

6. MMO. Coordinates the unit's participation in the program.

REFERENCES:

1. TI 4731-14/1
2. TM 4700-15/1